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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,750	03/27/2001	Geun Sig Cha	01-219	3998

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
1753	11

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-11

Office Action Summary

Application No.	Applicant(s)
09/818,750	CHA ET AL
Examiner	**Group Art Unit**
T. TUNG	1753

Paper No. 11

—Th MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

P riod for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☑ Claim(s) 3-7, 10-18 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☑ Claim(s) 3-7, 10-18 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Int rview Summary, PTO-413

☐ Notic of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other _____

Office Action Summary

The final rejection of Feb. 26, 2003 is hereby withdrawn.

Claims 3-7, 10-18 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The disclosure of the hydrogel electrolyte composition is confusing. At page 14, lines 14-18 of the specification, the composition is stated to be composed of glycerol solution, agar solution, polymer glue, "or other water soluble polymers". It is unclear what these other soluble polymers would be, and it is unclear if these other water soluble polymers are present by themselves or are in combination with the glycerol, agar and polymer glue.

Claims 5, 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The wording "or a soluble polymer dissolved with hygroscopic substance" at the last two lines of these claims is indefinite. Is this soluble polymer present along with the glycerol, agar and polymer glue, or in lieu thereof?

Also, at line 4 of these claims, the 19 percent is inconsistent with the 10 percent set forth at page 14, line 16 of the specification.

Claims 3-6, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki etal in view of Hofmeier etal 4,714,527, Ingruber 2,846,386, Maurer etal 4,252,124 or Jerrold-Jones 4,162,211.

As discussed in previous Office actions, Suzuki discloses a planar reference electrode having a glass substrate, a Ag/AgCl electrode, an internal reference electrolyte comprising hydrogel, a liquid junction, a polyamide insulation membrane and a silicone protective membrane. See page 1181 and figure 3.

Applicant claims (e.g. claim 16, last two lines) call for the junction to be "formed in a line of micro capillary". In the Feb. 26, 2003 Office action, the examiner raised the issue of what constitutes such a junction device and whether it has been adequately disclosed. During an interview on June 4, 2003 (incidentally the summary of that interview incorrectly identifies the date of the interview as June 4, 2001), applicant's representative apparently asserted that the "line of micro capillary" is a line representing an edge of a thin space between two surfaces. In the June 6, 2003 response, applicant contends that the disclosure at pages 16 and 17 as well as Example 4 in the specification provides an adequate explanation of the "line of micro capillary".

Upon closer examination, it would appear that the "line of micro capillary" as explained in the interview and as set forth in the specification is not the same. In Example 4, at page 22, lines 20-22, the "line of micro capillary" is apparently formed by making a straight channel from the electrolyte well to the outer boundary of the electrode with a sharp blade. It is not specified whether the channel is formed on the top surface of substrate 4 or through the insulation

membrane that defines the electrolyte well. Either way, the "line of micro capillary" would be a straight line channel extending from the electrolyte well to the outer boundary of the electrode, and would not be a line representing the edge between two surfaces. Applicant should confirm in his response to this Office action that the examiner has correctly interpretated his disclosure in regard to the "line of micro capillary". Since applicant now considers this term as the key distinction over the prior art or record, it is clearly necessary that the applicant and the examiner have a common understanding of the invention. If applicant takes the position that the "line of micro capillary" is a line representing the edge between two surfaces, he should point out the basis for this in the original disclosure.

Applicant's claims, then, differ from Suzuki by calling for a junction device that is a "line of micro capillary".

Hofmeier discloses a reference electrode 20 with a capillary liquid junction 23 leading to a sample liquid in channel 3. Junction 23 is a straight line micro capillary. See figures 1 and 2; col. 4, line 4 to col. 6, line 14.

Ingruber discloses a reference electrode with a capillary liquid junction 15, which is a straight line micro capillary. See figure 3; col. 2, line 22.

It would have been obvious for Suzuki to adopt the straight line capillary liquid junction of Hofmeier or Ingruber. A capillary type liquid junction has the advantage of being less vulnerable to blockage. However, it is generally more susceptible to back diffusion (sample diffusing into the reference electrode's internal electrolyte). Selecting one of a number of known alternatives is a

matter of design choice to suit a particular circumstance in the absence of unexpected result. Applicant's straight line capillary junction is seen to be performing as one would expect. Further, the incorporation of a straight line capillary junction by Suzuki is especially believed to be obvious, since the planar reference electrode shown in figure 2 of Suzuki appears to have such a junction means.

If applicant's liquid junction were somehow construed to be an edge defined between two surfaces (as suggested in the interview), such a junction device is also well-known. See Maurer (col. 4, lines 29-41) or Jerrold-Jones (col. 3, lines 60-65). It would have been obvious for Suzuki to adopt this edge-type liquid junction, for the advantages discussed at col. 4, line 35 of Maurer or col. 7, line 1 of Jerrold-Jones.

In regard to claim 5, the particular composition of the hydrogel electrolyte is a matter of choice in the absence of unexpected result.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki etal in view of Hofmeier etal, Ingruber, Maurer etal or Jerrold-Jones and Kotani.

This claim further differs by calling for the covering membrane to be made of polyester.

Kotani discloses terephthalate as construction material for a sensor component. See col. 7, line 18. It would have been obvious for Suzuki to use a polyester covering membrane in view of Kotani, because polyester is inert and transparent, properties that are desirable for an electrolytic sensor.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki etal in view of Hofmeier etal, Ingruber, Maurer etal or Jerrold-Jones and Cranny etal.

This claim calls for a method of fabricating the planar electrode. Most of the steps describe necessary and inherent operations for assembling the electrode. However, steps 2 and 3 differ from Suzuki by calling for the electrode and the insulating layer to be formed by screen printing.

Cranny discloses forming an electrode and an insulating layer by printing. See page 1558, right column. It would have been obvious for Suzuki to form the electrode and the insulating membrane layer by printing in view of Cranny, because the incorporation of known features from analogous prior art is within the skill of the art in the absence of unexpected result.

Claims 10, 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki etal in view of Neti etal 4,002,547.

These claims differ from Suzuki by calling for the insulating membrane layer that defines the electrolyte well to be porous and to also serve as the liquid junction.

Neti discloses a reference electrode wherein a housing 12 that acts to retain the electrolyte is porous at least in part so as to be able to serve as a liquid junction also. See col. 4, lines 7-12. It would have been obvious for Suzuki to use a porous insulating membrane layer that can also function as a liquid junction in view of Neti. A large junction area tends to minimize clogging, as discussed at col. 4, lines 29-32. Also, a single material construction (one without a junction device of a second material) would facilitate manufacturing. Further, there would not be any

thermal stress problems caused by difference in coefficients of expansion of the differing materials for the electrolyte housing and the junction.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki etal in view of Neti etal and Kater etal 3,498,899.

This claim further differs by calling for the porous membrane to be made of cellulose nitrate.

Kater discloses cellulose nitrate to be an old material for a liquid junction. See col. 3, line 8. It would have been obvious for Suzuki to make his liquid junction membrane out of cellulose nitrate, since the incorporation of a known feature from analogous prior art functioning as expected is within the skill of the art.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki etal in view of Neti etal and Cranny etal.

These claims further differ by calling for the electrode and the porous membrane to be formed by screen printing. As discussed before, that is rendered obvious by Cranny.

Claims 3, 4, 6, 16, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cranny etal in view of Hofmeier etal, Ingruber, Maurer etal or Jerrold-Jones.

Cranny discloses a planar reference electrode with an alumina substrate, a Ag electrode with a terminal lead portion on the substrate, a AgCl layer on the electrode, an electrolyte layer over the AgCl layer, a support housing (sealant layer) over and around the electrolyte and the electrode, and a hydration port in the sealant layer that presumably acts as a liquid junction. The

various layers are applied by printing. See figure 1 and page 1558. Applicant's claims differ by calling for the junction to be a "line of micro capillary".

As discussed before, Hofmeier or Ingruber discloses a liquid junction in the form of a straight line capillary, and Maurer or Jerrold-Jones discloses a liquid junction in the form of a line that represents an edge between two contacting surfaces. It would have been obvious for Cranny to adopt either of these two types of liquid junction. The strengths and weaknesses of all these liquid junctions are known, and it would be a matter of design choice to select a particular one for a particular application.

Claims 5, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cranny etal in view of Hofemeier etal, Ingruber, Maurer etal or Jerrold-Jones and Kotani.

Claim 5 differs by calling for the electrolyte to be a hydrogel, while claim 7 differs by calling for a covering membrand made of polyester.

Kotani discloses a hydrogel elctrolyte (col. 5, lines 32-47) and terephthalate (a polyester) as a construction material (col. 7, line 18). It would have been obvious for Suzuki to further adopt these features. A hydrogel slows down evaporation, as well as make the sensor position-insensitive. A polyester material is inert and transparent, desirable properties for a sensor.

Claims 10, 12, 13, 15, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cranny etal in view of Neti etal.

These claims differ by calling for the insulating membrane that defines the electrolyte well to be porous so as to serve as the liquid junction also. As discussed before, that is rendered obvious by Neti.

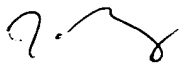
Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cranny etal in view of Neti etal and Kater etal.

This claim further differs by calling for the porous membrane to be made of cellulose nitrate. As discussed before, that is rendered obvious by Kater.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cranny etal in view of Neti etal and Kotani.

This claim further differs by calling for a hydrogel electrolyte. As discussed before, Kotani renders that obvious.

The examiner can be reached at 703-308-3329. His supervisor Nam Nguyen can be reached at 703-308-3322. Any general inquiry should be directed to the receptionist at 703-308-0661. A fax number for TC 1700 is 703-872-9310.



Ta Tung

Primary Exminer

Art Unit 1753